Risk Factors for CMV Transmission in Seronegative HCT Recipients

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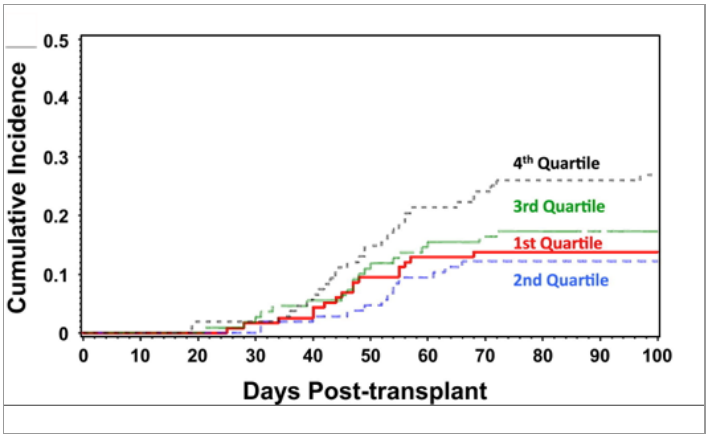
Cytomegalovirus (CMV) is the most frequent viral complication following hematopoietic cell transplantation (HCT). Seronegative recipients who receive grafts from seropositive donors (D+/R-) are at risk for primary CMV transmission, as well as a higher incidence of non-CMV infections and increased mortality when compared to D-/R- HCT recipients. In order to better understand this type of primary CMV transmission, Dr. Steven Pergam and Dr. Michael Boeckh, along with collaborators in the Vaccine and Infectious Disease Division, studied risk factors associated with CMV transmission in D+/R- HCT recipients at the FHCRC.

In this retrospective study, 447 CMV seronegative HCT recipients who received a transplant from a seropositive donor at FHCRC between 1995 and 2007 were evaluated, using clinical data and medical records from the first 100 days after HCT. Each patient was tested weekly using either the pp65 antigenemia assay, which quantifies the level of replicating virus by assessing antigen expression in leukocytes, or tested by PCR to monitor levels of CMV DNA. If patients did test positive, they began antiviral therapy. CMV transmission was detected in 85 of 447 (19%) of patients in the first year post-transplant. 76 primary infections occurred before day 100, with an additional 9 between d100 and 1 year.

In risk factor analyses, patients with a higher number of total nucleated cells (TNC) in their graft (the upper fourth quartile) were at significantly higher risk for CMV transmission (HR 2.0, 95% CI, 1.2-3.1). There was a trend toward an association with a higher risk of CMV transmission with a higher quartile of CD34 cells in the graft (HR 1.5, 95% CI, 0.9-2.6). Other cellular components were not shown to alter the risk of CMV acquisition, nor did the source stem cells, screening method, or GVHD. This study demonstrated that a highly cellular graft was the only risk factor associated with CMV transmission in D+/R- HCT recipients. The authors suggest that future studies evaluating donor immunity may lead to additional predictors of viral transmission that could be important in donor selection and risk assessment.

Pergam SA, Xie H, Sandhu R, Pollack M, Smith J, Stevens-Ayers T, Ilieva V, Kimball LE, Huang ML, Hayes TS, Corey L, Boeckh MJ. 2012. Efficiency and Risk Factors for CMV Transmission in Seronegative Hematopoietic Stem Cell Recipients. *Biology of Blood and Marrow Transplantation*. DOI: 10.1016/j.bbmt.2012.02.008



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Cumulative incidence of CMV transmission by total nucleated cell count quartiles